

**Christine Blondel.** *Ampère et la création de l'électrodynamique (1820–1827)*. (Ministère de l'Education Nationale Comités des Travaux Historiques et Scientifiques, Mémoires de la Section des Sciences, 10.) 202 pp., figs., bibl., index. Paris: Bibliothèque Nationale, 1982. Fr 175 (paper).

Anyone who sets out to study seriously the work of André-Marie Ampère on electrodynamics faces formidable difficulties and obstacles. With most scientists, there is generally an easily definable *oeuvre*, consisting of the books and articles they have written during their productive years. It is only now becoming clear that this *oeuvre*, for Ampère, is a far more complicated thing. He constantly rewrote and published articles without giving any indication that he had made changes. For example, Cornell has two copies of his *Exposé méthodique des phénomènes électrodynamiques*, a small treatise fundamental to an understanding of his ideas, which contain twenty-six and forty-two pages respectively. They differ greatly in their contents, and unless they are specified, it is impossible to know what is going on. Clues to Ampère's revisionist activities can be found in the published correspondence, but this, too, is untrustworthy, containing many errors of transcription and dating. Finally, the forty-odd cartons of manuscripts preserved in the archives of the Académie des Sciences in Paris are filled with undated scribblings, unfinished memoirs, jottings, notes, and other *disjecta membra* of Ampère's science almost impossible to date and put in any kind of believable order. To set out into this almost uncharted wilderness takes both courage and a cool head. Christine Blondel has both, and the result is the best published work to date on what Ampère was up to in those bursts of incredible creativity during the 1820s.

Blondel sets the stage by a brief (perhaps

too brief) history of electricity and magnetism before 1820, together with short biographies of those who interacted with Ampère during his fever of discovery. I must confess to liking large books, and here is one place where I wish the author had expanded her tale somewhat, for she has all the right instincts. For example, she is quite skeptical of the current fad that tries to see French science as split between arrogant Fresnelian upstarts and pompous Laplacian conservatives. Surely the rancor within the Académie was the result more of personal hostility between Arago and Biot than of any fundamental division within science. Blondel hints at all this, but she would have done all students of French science in the early nineteenth century a considerable service by laying the myth to rest once and for all.

There then follows a step-by-step consideration of Ampère's work, centering on the spate of memoirs that appeared from the autumn of 1820 through the summer of 1822. The author has seen and read everything on the subject, and her account is both sober and plausible. Nevertheless, I think she is wrong about the early discoveries and will here only refer the reader to my article on the subject in the December 1983 issue of *Isis*, written before I saw Blondel's work. Blondel does important work here, for she fleshes out the published accounts with material drawn both from the correspondence and from the archives of the Académie. The result is a much fuller, more cohesive, and greatly improved account of Ampère's early labors.

The last part of the work is devoted to Ampère's defense and further development of his theory in the face of criticism, particularly from Michael Faraday. Here the narrative tends to race a bit, as if the author were impatient to finish. This, I think, is the result of her refusal to widen her focus, as Ampère did, during these years. She sticks resolutely to Ampère's theory of magnetism, even though Ampère seemed willing to extend his thoughts beyond current-carrying wires to such other areas as electrochemistry. Blondel senses this, and to a certain extent forestalls criticism by republishing Ampère's memoir on electrochemistry as an appendix, but, like an appendix, the memoir seems just stuck on, without a sufficient context in the electrochemistry of the day.

As with any work, there are some minor criticisms. Many of the figures are reproduced poorly from Ampère's memoirs. They are often very difficult to interpret because of faint lines and even fainter letters although Blondel offers few descriptions in which the letters figure. Unless the reader is already familiar with the apparatus, I suspect these illustrations will make for very hard going. The author also emphasizes passages in Ampère without indicating whether or not they are her emphases or Ampère's. Since this is likely to be the standard work for some years to come, this practice destroys some of its usefulness, for anyone wishing to quote Ampère will have to go back to the original. Although Blondel often quotes original English documents in English, for some reason she uses the French translation of Faraday's very important letter of February 1822 in de Launay's edition of Ampère's correspondence, which gives the wrong date. For anyone checking the original, confusion over de Launay's date of 1821 and the correct one, given in *The Selected Correspondence of Michael Faraday* (1822), is sure to follow.

But these are small matters indeed. This is a first-rate piece of work and ought to figure in the library of everyone interested in the physical sciences in the nineteenth century.

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